



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/754,079	01/05/2001	James L. Richards	1659.0980001	4716

29099 7590 05/19/2004  
TIME DOMAIN CORPORATION  
7057 OLD MADISON PIKE  
HUNTSVILLE, AL 35806

EXAMINER

WARE, CICELY Q

ART UNIT	PAPER NUMBER
----------	--------------

2634

DATE MAILED: 05/19/2004

12

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No:

09/754,079

Applicant(s)

RICHARDS ET AL.

Examiner

Cicely Ware

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 05 January 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-87 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 32-50,61-71 and 75-87 is/are allowed.
- 6) ☒ Claim(s) 1,2,7,8,11,12,17,18,21,22,27,28,31,51,52,57-59, 72 and 73 is/are rejected.
- 7) ☒ Claim(s) 3-6,9,10,13-16,19,20,23-26,29,30,53-56,60 and 74 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 January 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 6.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. This application has been filed with informal drawings, which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

### ***Specification***

2. The abstract of the disclosure is objected to because
  - a. Pg. 164, examiner suggests applicant delete "A281-91.wpd". Correction is required. See MPEP § 608.01(b).
3. The disclosure is objected to because of the following informalities:
  - a. Pg. 12, lines 17 and 20, examiner suggests applicant delete "and".
  - b. Pg. 18, line 26, examiner suggests applicant move this line to Pg. 19, line 1.
  - c. Pg. 21, line 26, examiner suggests applicant move this line to Pg. 22, line 1.
  - d. Pg. 29, line 26, examiner suggests applicant move this line to Pg. 30, line 1.
4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Appropriate correction is required.

### ***Claim Objections***

5. Claims 29 and 39 are objected to because of the following informalities:
- a. Claim 29, lines 7 and 9, examiner assumes applicant means "c.1 and c.2".
  - b. Claim 39, line 14, applicant uses "separatee". Examiner suggests using "separate" for clarification purposes.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 73 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 73 applicant discloses a method and apparatus, wherein "the receiver comprises the step of: a demodulator.....". Examiner is unable to distinguish as to whether applicant is claiming a method or an apparatus. Examiner suggests applicant distinctly specify whether claim 73 is a method or an apparatus.

### ***Double Patenting***

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11

Art Unit: 2634

F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claim 72 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 37 of U.S. Patent No. 6,529,568. Although the conflicting claims are not identical, they are not patentably distinct from each other because the subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming a method and apparatus for reducing interference in an impulse radio receiver.

Applicant recites in claim 72 of the instant application, an impulse radio receiver subsystem for reducing potential interference, comprising: a data sampler adapted to sample a received signal at data sampling times to produce a sequence of data samples; a nulling sampler adapted to sample the received signal at a time offset from each of the data sample times to produce a sequence of nulling samples; and a combiner adapted to separately combine each of the data samples with a corresponding nulling sample from the sequence of nulling samples to produce a sequence of adjusted samples.

Claims 27, 29 and 37 of Richards et al. (US Patent 6,529,568) disclose all of the above subject matter.

10. Claims 1, 2, 7, 8, 11, 12, 17, 18, 21, 22, 27, 28, 31, 51, 57-59 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3, 14, 24-26, 27, 29, 43, 45 and 51 of U.S. Patent No. 6,529,568 in view of Baum et al. (US Patent 6,201,795).

(1) With regard to claim 1, applicant recites: A method of reducing potential interference in an impulse radio receiver, comprising the steps of: receiving a signal including an impulse signal, the impulse signal including a sequence of impulses spaced in time from one another; sampling the sequence of impulses at a sequence of data sample times to produce a sequence of data samples; sampling the received signal at a time offset from each of the data sample time to produce a nulling sample corresponding to each of the data samples, thereby producing a sequence of nulling samples corresponding to the time offset; separately combining each of the data samples with a corresponding nulling sample from the sequence of nulling samples to produce a sequence of adjusted samples corresponding to the time offset.

Richards et al. (US Patent 6,529,568) discloses in Claim 1: A method of canceling interference in an impulse radio comprising the steps of: a. receiving an ultra-wideband impulse signal and interference; b. sampling the interference to produce a nulling sample; c. sampling the impulse signal in the presence of the interference to

produce a data sample, the data sample including interference energy; and d. canceling the interference energy from the data sample using the nulling sample.

Though the instant application is silent as to an ultra-wideband signal, it is well known in the art that in an impulse radio system, the impulse signal comprises a train of low power impulses having an ultra-wideband frequency characteristic as recited in applicant's admitted prior art.

Examiner asserts that the instant application therefore encompasses the entire subject matter already disclosed in Richards et al. (US Patent 6,529,568).

However Richards et al. does not disclose determining a first quality metric associated with the sequence of adjusted samples; determining a second quality metric associated with the sequence of data samples; and selecting a preferred sequence of samples based on the first and second quality metrics.

However Baum et al. discloses a method and apparatus for mitigating interference in a communication system, determining a first quality metric associated with the sequence of adjusted samples; determining a second quality metric associated with the sequence of data samples; and selecting a preferred sequence of samples based on the first and second quality metrics (col. 5, lines 13-19, 61-63, col. 6, lines 22-31, 39-67, col. 7, lines 1-14).

Therefore it would have been obvious to one of ordinary skill in the art to modify Richards et al. to incorporate determining a first quality metric associated with the sequence of adjusted samples; determining a second quality metric associated with the sequence of data samples; and selecting a preferred sequence of samples based on

the first and second quality metrics so that system capacity is not detrimentally impacted and disruptions in service are eliminated (Baum et al., col. 1, lines 65-67).

(2) With regard to claim 2, claim 2 inherits all the limitations of claim 1. Richards et al. (US Patent 6,529,568) further discloses in claim 3, further signal processing the preferred sequence of samples.

(3) With regard to claim 7, claim 7 inherits all the limitations of claim 1. Richards et al. (US Patent 6,529,568) further discloses in Claims 24-26 wherein the time offset is associated with a nulling frequency, which can be an ensemble of frequencies.

(4) With regard to claim 8, claim 8 inherits all the limitations of claim 1. Richards et al. (US Patent 6,529,568) further discloses in claim 14, wherein the sampling of the received signal at the time offsets in comprises sampling the impulse signal so as to avoid sampling the impulse signal.

(5) With regard to claim 11, claim 11 inherits all the limitations of claim 1. Richards et al. (US Patent 6529568) further discloses in claims 27 and 51, sampling the received signal at a plurality of time offsets from each of the data sample times to produce a plurality of nulling samples corresponding to each of the data samples, thereby producing a separate sequence of nulling samples for each of the time offsets; separately combining each of the data samples with a corresponding nulling sample from each of the separate sequences of nulling samples to produce a separate sequence of adjusted samples corresponding to each of the time offsets.

(6) With regard to claim 12, claim 12 inherits all the limitations of claims 11 and 2 above.



(7) With regard to claim 17, claim 17 inherits all the limitations of claims 11 and 7 above. Richards et al. (US Patent 6,529,568) further discloses in claims 24-26 wherein each of the plurality of time offsets is associated with a separate nulling frequency, which can be an ensemble of frequencies.

(8) With regard to claim 18, claim 18 inherits all the limitations of claims 11 and 8 above. Richards et al. (US Patent 6,529,568) further discloses in claims 14, 24-26, wherein the sampling of the received signal at the plurality time offsets in comprises sampling the impulse signal so as to avoid sampling the impulse signal.

(9) With regard to claim 21, claim 21 inherits all the limitations of claim 1.

Richards et al. (US Patent 6,529,568) further discloses in Claim 24-26, a method of processing a received signal including an impulse signal and potential interference in an impulse radio receiver.

(10) With regard to claim 22, claim 22 inherits all the limitations of claims 21 and 12 above.

(11) With regard to claim 27, claim 27 inherits all the limitations of claims 21 and 17 above.

(12) With regard to claim 28, claim 28 inherits all the limitations of claim 21 and 18 above.

(13) With regard to claim 31, claim 31 inherits all the limitations of claims 1 and 2 above.

(14) With regard to claim 51, claim 51 inherits all the limitations of claim 1.

Richards et al. (US Patent 6,529,568) further discloses in claims 27 and 29, wherein an impulse radio receiver subsystem for reducing potential interference, comprising: a data sampler adapted to sample a received signal at data sampling times to produce a sequence of data samples; a nulling sampler adapted to sample the received signal at a time offset from each of the data sample times to produce a sequence of nulling samples; a combiner adapted to separately combine each of the data samples with a corresponding nulling sample from the sequence of nulling samples to produce a sequence of adjusted samples.

However Richards et al. (US Patent 6,529,568) does not disclose a first quality metric generator adapted to determine a first quality metric associated with the sequence of data samples; a second quality metric generator adapted to determine a second quality metric associated with the sequence of adjusted data samples; and a selector adapted to select either the sequence of data samples or the sequence of adjusted samples, based on the first and second quality metrics.

However Baum et al. discloses in (Fig. 5) a communication system wherein a first quality metric generator is adapted to determine a first quality metric associated with the sequence of data samples; a second quality metric generator adapted to determine a second quality metric associated with the sequence of adjusted data samples; and a selector adapted to select either the sequence of data samples or the sequence of adjusted samples, based on the first and second quality metrics (col. 5, lines 13-19, 61-63, col. 6, lines 22-31, 39-67, col. 7, lines 1-14, Fig. 5 (505, 507, 509)).

Therefore it would have been obvious to one of ordinary skill in the art to modify Richards et al. (US Patent 6,529,658) to incorporate a first quality metric generator adapted to determine a first quality metric associated with the sequence of data samples; a second quality metric generator adapted to determine a second quality metric associated with the sequence of adjusted data samples; and a selector adapted to select either the sequence of data samples or the sequence of adjusted samples, based on the first and second quality metrics so that system capacity is not detrimentally impacted and disruptions in service are eliminated (Baum et al., col. 1, lines 65-67).

(15) With regard to claim 52, claim 52 inherits all the limitations of claim 51. Richards et al. (US Patent 6,529,568) does not explicitly disclose a demodulator to demodulate the sequence selected by the selector. However demodulation is inherent to a receiver. It is well known in the art that a demodulator must be used in order to recover the selected data.

(16) With regard to claim 57, claim 57 inherits all the limitations of claims 51 and 17 above. Richards et al. (US Patent 6,529,568) further discloses in claims 24-26 wherein each of the plurality of time offsets is associated with a separate nulling frequency, which can be an ensemble of frequencies.

(17) With regard to claim 58, claim 58 inherits all the limitations of claims 51 and 18 above. Richards et al. (US Patent 6,529,568) further discloses in claims 14, 24-26, wherein the sampling of the received signal at the plurality time offsets comprises sampling the impulse signal so as to avoid sampling the impulse signal.

(18) With regard to claim 59, claim 59 inherits all the limitations of claim 51. Richards et al (US Patent 6,529,568) further discloses in claims 43 and 45 the nulling sampler includes a correlator adapted to correlate the received signal in accordance with a first sampling control signal, to produce first correlation results representing the sequence of nulling samples; and the data sampler includes a correlator adapted to correlate the received signal in accordance with a second sampling control signal, to produce second correlation results representing the sequence of data samples.

***Allowable Subject Matter***

11. Claims 3-6, 9, 10, 13-16, 19, 20, 23-26, 29, 30, 53-56, 60, 74 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
12. Claims 32-50, 61-71, 75-87 are allowed.
13. The following is a statement of reasons for the indication of allowable subject matter: The instant application discloses a method for reducing potential interference in an impulse radio receiver. Prior art references show similar methods but fail to teach: **“accumulating N data samples of the plurality of data samples to produce an accumulated data sample, wherein N is an integer greater than one”**, as in claim 32; **“searching for a preferred time offset at which to produce nulling samples”**, as in claims 33 and 38; **“determining a separate quality metric for each of the separate sequences of adjusted samples; and selecting one of the plurality of**

**time offsets as the preferred time offset based on the quality metrics” as in claim 43 and 45; “repeating steps (b) through (e) over time for a plurality of different time offsets, thereby determining a quality metric associated with each of the plurality of different time offsets”, as in claim 44 and 47; “a plurality of combiners”, as in claim 61; “a first accumulator, a second accumulator”, as in claim 71; “an interference analyzer”, as in claim 75; “the interference analyzer comprises: a further data sampler, a further nulling sampler, a combiner, a quality metric generator, and a selector”, as in claim 80.**

### ***Conclusion***

14. The prior art made record of and not relied upon is considered pertinent to applicant's disclosure:

a. Blackwell et al. US Patent 6,259,680 discloses a method and apparatus for echo cancellation.

b. Casabona et al. US Patent 5,822,429 discloses a system for preventing global positioning satellite signal reception to unauthorized personnel.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cicely Ware whose telephone number is 703-305-8326. The examiner can normally be reached on Monday – Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone numbers

Application/Control Number: 09/754,079  
Art Unit: 2634

Page 13

for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

*Cicely Ware*

cqw  
May 3, 2004

  
STEPHEN CHIN  
SUPERVISORY PATENT EXAMINE  
TECHNOLOGY CENTER 2600